REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the pending application. The Office Action dated April 16, 2008 has been received and its contents carefully reviewed.

Claims 1 and 9 are hereby amended. Claim 10 is canceled without prejudice or disclaimer. Support for the amendment can found, for example, at specification, page 9, lines 18-19. No new matter has been added. Accordingly, claims 1-9 and 11-12 are currently pending. Reexamination and reconsideration of the pending claims are respectfully requested.

The present application claims priority to Korean Patent Application Nos. 10-2004-0081110 filed on October 11, 2004 and 10-2005-0094798 filed October 10, 2005. The Office Action requests Applicants to file certified copies of the two Korean Applications. The present application is a PCT national phase application. USPTO "will normally request the International Bureau to furnish the copy of the certified priority document upon receipt of applicant's submission under 35 U.S.C. 371 to enter the U.S. national phase. M.P.E.P. §1893.03(c). The Office Action does not explain why certified copies are requested. In any event, Applicants submit the certified copies of the two Korean Applications with this paper.

The Office Action objects to the drawings under 37 C.F.R. §1.83(a). Specifically, the Office Action states "the diameter of the zirconia particles shown [in Fig. 3(b)] are 300 nm, which is not what is claimed, nor supported by the specification." *Office Action*, page 2. Applicants respectfully traverse the objection. Fig. 3(b) shows a "**Comparative Example**, which used the powder 300 nm as a matrix phase can freely contact with hydroxyapatite so that a large amount of zirconia reacts with hydroxyapatite." *Specification*, page 12, lines 1-5, emphasis added. Fig. 3(a) shows an exemplary embodiment of the claimed invention and provides a powder with 10 nm particle diameter, i.e., within the range claimed. Applicants, therefore, respectfully request withdrawal of the rejection.

The Office Action rejects claims 1-8 under 35 U.S.C. §112, second paragraph, as being indefinite. Specifically, the Office Action states "it is unclear what applicant means by 'secondary particle state'" and "[i]t is unclear if applicant means the sintered composite is no longer in the powder state." *Office Action*, page 3. Applicants respectfully traverse the rejection.

Applicants clearly define what is "secondary particle sate." For example, the specification states "zirconia primary particles having a particle diameter of 10-50 nm and alumina primary particle having a particle diameter of 10-100 nm are sintered to form the nano-scale composite in a secondary particle state" and "the term 'nano-composite-powder' refers to powder produced by nano-sintering at least two primary particles of nano-sized metal oxide to form a composite in a secondary particle state." *Specification*, page 4, line 34, to page 5, line 6, emphases added. Therefore, read in context with the specification, the term "secondary particle state" is not indefinite. Accordingly, Applicants respectfully request withdrawal of the rejection.

The Office Action rejects claims 9 and 11 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,960,733 to Kasuga et al. (*Kasuga '733*). Applicants respectfully traverse the rejection.

As required in M.P.E.P. § 2131, in order to anticipate a claim under 35 U.S.C. § 102, "the reference must teach every element of the claim." *Kasuga '733* fails to teach each and every element of claims 9 and 11, and thus cannot anticipate these claims.

Claim 9 recites, "wherein the preparing of a zirconia-alumina nano-composite-powder comprises: mixing a mixed solution of polyhydric alcohol and carboxylic acid and a mixed solution of zirconium salt and aluminum salt; heating the mixture to 100-300°C to form a polyester network in which zirconium ions and aluminum ions are trapped; and calcining the resultant at 400-1000°C." *Kasuga '733* fails to teach at least these elements of claim 9. In fact, the Office Action admits that *Kasuga '733* "fails to expressly disclose the method of making the zirconia-alumina composite." *Office Action*, page 6. Accordingly, claim 9 is allowable over *Kasuga '733*. Claim 11 depends from claim 9, and is also allowable over *Kasuga '733* for at least the same reasons as claim 9. Applicants, therefore, respectfully request withdrawal of the rejection.

The Office Action rejects claims 1 and 3-8 under 35 U.S.C. §103(a) as being obvious over *Kasuga '733* in view of U.S. Patent No. 6,007,926 to Provenzano et al. (*Provenzano*). Applicants respectfully traverse the rejection.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. The combined teaching of *Kasuga '733* and *Provenzano* fails to teach each and every element of claims 1 and 3-8, and thus cannot render these claims obvious.

Claim 1 cites, "the nano-scale composite in a secondary particle state has a size of 100-200 nm." *Kasuga '733* fails to teach or suggest at least this element of claim 1. Instead, *Kasuga '733* teaches away stating that "the zirconia-alumina ceramic to be mixed with the matrix glass is also preferred to have a particle size of larger (finer) than 200 meshes." *Kasuga '733*, column 4, lines 29-31, emphasis added. *Provenzano* does not cure the deficiency of *Kasuga '733*. *Provenzano* teaches that zirconia and alumina particles have particle sizes of 10 nm. *Provenzano*, column 4, lines 32-35. Accordingly, claim 1 is allowable over the combined teaching of *Kasuga '733* and *Provenzano*. Claims 3-8 variously depend from claim 1, and are also allowable over the combined teaching of *Kasuga '733* and *Provenzano* for at least the same reasons as claim 1. Applicants, therefore, respectfully request withdrawal of the rejection.

The Office Action rejects claim 10 under 35 U.S.C. §103(a) as being obvious over Kasuga in view of *Provenzano* and further in view of U.S. Patent No. 5,399,608 to Allen et al. (*Allen*) and U.S. Patent Application Publication No. 2003/0059742 to Webster et al. (*Webster*). Applicants have canceled claim 10 and incorporated the elements of claim 10 into claim 9. The combined teaching of *Kasuga '733*, *Provenzano*, *Allen*, and *Webster* fails to teach or suggest each and every element of claim 9, and thus cannot render claim 9 obvious.

Claim 9 recites, "wherein the preparing of a zirconia-alumina nano-composite-powder comprises: mixing a mixed solution of polyhydric alcohol and carboxylic acid and a mixed solution of zirconium salt and aluminum salt; heating the mixture to 100-300°C to form a polyester network in which zirconium ions and aluminum ions are trapped; and calcining the resultant at 400-1000°C." *Kasuga '733* and *Provenzano* fail to teach or suggest at least these elements of claim 9. In fact, the Office Action admits that both *Kasuga '733* and *Provenzano* "fail to expressly disclose including a polyester network in which zirconium and aluminum ions are trapped." *Office Action*, page 7. *Allen* does not cure the deficiency of *Kasuga '733* and *Provenzano*. *Allen* is only cited for disclosing mixing alumina powder with zirconia powder using a liquid dispersant. *Office Action*, page 6. *Webster* does not cure the deficiency of *Kasuga*

'733 and *Provenzano* either. *Webster* discloses "[a]lumina nanofibers." *Webster*, ¶0044, emphasis added. *Webster* does not teach a zirconia-alumina nano-composite-powder, as required by claim 9. Accordingly, claim 9 is patentable over the combined teaching of *Kasuga '733*, *Provenzano*, *Allen*, and *Webster*.

The Office Action rejects claims 1-9, 11 and 12 under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,232,878 to Kasuga et al. (*Kasuga '878*) in view of *Provenzano*. Applicants respectfully traverse the rejection.

Claim 1 cites, "the nano-scale composite in a secondary particle state has a size of 100-200 nm." *Kasuga '878* fails to teach or suggest at least this element of claim 1. In fact, the Office Action admits that "Kasuga '878 fails to expressly disclose the zirconia and alumina particles having particle sizes in the claimed range." *Office Action*, page 8. *Provenzano* does not cure the deficiency of *Kasuga '733*. *Provenzano* teaches that zirconia and alumina particles have particle sizes of 10 nm. *Provenzano*, column 4, lines 32-35. Accordingly, claim 1 is patentable over the combined teaching of *Kasuga '878* and *Provenzano*. Claims 3-8 variously depend from claim 1, and are also allowable over the combined teaching of *Kasuga ' 878* and *Provenzano* for at least the same reasons as claim 1.

Claim 9 recites, "wherein the preparing of a zirconia-alumina nano-composite-powder comprises: mixing a mixed solution of polyhydric alcohol and carboxylic acid and a mixed solution of zirconium salt and aluminum salt; heating the mixture to 100-300°C to form a polyester network in which zirconium ions and aluminum ions are trapped; and calcining the resultant at 400-1000°C." *Kasuga '878* fails to teach or suggest at least these elements of claim 9. The Office Action admits that *Kasuga '878* fails to expressly disclose the zirconia-alumina composite powder being a nano-composite. *Office Action*, page 8. *Provenzano* does not cure the deficiency of *Kasuga '878*. *Provenzano* is only cited for disclosing creating ceramics from a zirconia-alumina nano-composite powder. *Office Action*, page 8. Accordingly, claim 9 is patentable over the combined teaching of *Kasuga '878* and *Provenzano*. Claims 11 and 12 depend from claim 9, and are also patentable over the combined teaching of *Kasuga '878* and *Provenzano* for at least the same reasons as claim 9. Applicants, therefore, respectfully request withdrawal of the 35 U.S.C. §103(a) rejection of claims 1-9, 11 and 12.

The Office Action rejects claims 1, 2, 9, and 11 under 35 U.S.C. §103(a) as being obvious over *Webster*. Applicants respectfully traverse the rejection.

Claim 1 cites, "the nano-scale composite in a secondary particle state has a size of 100-200 nm." Claim 9 recites, "wherein the preparing of a zirconia-alumina nano-composite-powder comprises: mixing a mixed solution of polyhydric alcohol and carboxylic acid and a mixed solution of zirconium salt and aluminum salt; heating the mixture to 100-300°C to form a polyester network in which zirconium ions and aluminum ions are trapped; and calcining the resultant at 400-1000°C." As discussed, Webster fails to teach or suggest the above-recited elements of claims 1 and 9. Accordingly, claims 1 and 9 are patentable over Webster. Claim 2 depends from claim 1, and claim 11 depends from claim 9. Claims 2 and 11 are also patentable over Webster for at least the same reasons as claims 1 and 9. Applicants, therefore, respectfully request withdrawal of the rejection.

The application is in condition for allowance. Early and favorable action is respectfully solicited. If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (202) 496-7500 to discuss the steps necessary for placing the application in condition for allowance. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. A duplicate copy of this sheet is enclosed.

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Respectfully submitted,

By /Newton Hathcock/
for **Mark R. Kresloff** Reg. 54824
Registration No.: 42,766
McKENNA LONG & ALDRIDGE LLP
1900 K Street, N.W.
Washington, DC 20006
(202) 496-7500
Attorneys for Applicant

Attachments